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APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
09/681,712	05/24/2001	Johji Nakamoto	JP919990277US1	7818

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IBM MICROELECTRONICS  
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EXAMINER	
LEADER, WILLIAM T	
ART UNIT	PAPER NUMBER

1742

DATE MAILED: 01/08/2004

Please find below and/or attached an Office communication concerning this application or proceeding.

**Office Action Summary**

Application No.

09/681,712

Applicant(s)

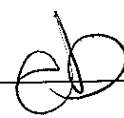
NAKAMOTO ET AL.

Examiner

William T. Leader

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-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --

**Period for Reply**

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If the period for reply specified above is less than thirty (30) days, a reply within the statutory minimum of thirty (30) days will be considered timely.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133).
- Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

**Status**

- 1) ☒ Responsive to communication(s) filed on 15 October 2003.
- 2a) ☐ This action is **FINAL**.                      2b) ☒ This action is non-final.
- 3) ☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

**Disposition of Claims**

- 4) ☒ Claim(s) 1-34 is/are pending in the application.
- 4a) Of the above claim(s) 23-34 is/are withdrawn from consideration.
- 5) ☐ Claim(s) \_\_\_\_\_ is/are allowed.
- 6) ☒ Claim(s) 1-22 is/are rejected.
- 7) ☐ Claim(s) \_\_\_\_\_ is/are objected to.
- 8) ☐ Claim(s) \_\_\_\_\_ are subject to restriction and/or election requirement.

**Application Papers**

- 9) ☐ The specification is objected to by the Examiner.
- 10) ☐ The drawing(s) filed on \_\_\_\_\_ is/are: a) ☐ accepted or b) ☐ objected to by the Examiner.  
Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).  
Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).
- 11) ☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

**Priority under 35 U.S.C. §§ 119 and 120**

- 12) ☒ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).  
a) ☒ All   b) ☐ Some \* c) ☐ None of:  
1. ☒ Certified copies of the priority documents have been received.  
2. ☐ Certified copies of the priority documents have been received in Application No. \_\_\_\_\_.  
3. ☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).  
\* See the attached detailed Office action for a list of the certified copies not received.
- 13) ☐ Acknowledgment is made of a claim for domestic priority under 35 U.S.C. § 119(e) (to a provisional application) since a specific reference was included in the first sentence of the specification or in an Application Data Sheet. 37 CFR 1.78.  
a) ☐ The translation of the foreign language provisional application has been received.
- 14) ☐ Acknowledgment is made of a claim for domestic priority under 35 U.S.C. §§ 120 and/or 121 since a specific reference was included in the first sentence of the specification or in an Application Data Sheet. 37 CFR 1.78.

**Attachment(s)**

- 1) ☒ Notice of References Cited (PTO-892)
- 2) ☐ Notice of Draftsperson's Patent Drawing Review (PTO-948)
- 3) ☒ Information Disclosure Statement(s) (PTO-1449) Paper No(s) 5-7-02.
- 4) ☐ Interview Summary (PTO-413) Paper No(s). \_\_\_\_\_
- 5) ☐ Notice of Informal Patent Application (PTO-152)
- 6) ☐ Other: \_\_\_\_\_

### DETAILED ACTION

1. Applicant's election without traverse of claims 1-28 in the paper filed on October 15, 2003, is acknowledged. Applicant further elected species 1) and identified claims 1-22 as reading on the elected species. Claims 23-34 are withdrawn from consideration.

### *Claim Rejections - 35 USC § 102*

2. The following is a quotation of the appropriate paragraphs of 35 U.S.C. 102 that form the basis for the rejections under this section made in this Office action:

A person shall be entitled to a patent unless –

(b) the invention was patented or described in a printed publication in this or a foreign country or in public use or on sale in this country, more than one year prior to the date of application for patent in the United States.

3. Claims 1-6, 11 and 15-17 are rejected under 35 U.S.C. 102(b) as being anticipated by Alkire et al (4,043,891).

4. The Alkire et al patent is directed to apparatus for the electrodeposition of metal onto substrates such as printed circuits boards. As shown in figure 1, a source material is connected as anode 100 to the positive terminal of power supply 121; an object to be plated is connected as cathode 120 to the negative terminal of power supply 121; conductive perforated electrode plates 110 and 114, which are electrically connected to each other through bus 112, are disposed between anode 100 and cathode 120. Thus, all elements recited in instant claim 1 are disclosed by Alkire.

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5. With respect to claim 2, a plating tank filled with a plating solution is provided. With respect to claim 3, the conductive perforated plate disposed on the object side is in the vicinity of the object but not in contact with the object, and the conductive perforated plate disposed on the source material side is in the vicinity of the source material but not in contact with the source material. See the position of the elements in figure 1. With respect to claim 4, perforated plates 110 and 114 are electrically separated from the source material and the object, and function as bipolar electrodes (column 3, line 45). With respect to claim 5, the first terminal of the power supply is adapted to provide an anodic voltage while the second terminal of the power supply is adapted to provide a cathodic voltage. See figure 1. With respect to claim 6, the perforated plates 110 and 114 are electrically connected by bus 112 which conducts current between them (column 3, lines 8-9). With respect to claim 11, the shape and size of the perforated plates may be the same size as those of the object. See figure 3. With respect claim 15, the source material from which the anode is made may be copper (column 1, lines 32). With respect to claims 16 and 17, the perforated plates 110 and 114 may be made of platinized titanium (column 3, lines 56-58).

### *Claim Rejections - 35 USC § 103*

6. The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

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(a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negated by the manner in which the invention was made.

7. This application currently names joint inventors. In considering patentability of the claims under 35 U.S.C. 103(a), the examiner presumes that the subject matter of the various claims was commonly owned at the time any inventions covered therein were made absent any evidence to the contrary.

Applicant is advised of the obligation under 37 CFR 1.56 to point out the inventor and invention dates of each claim that was not commonly owned at the time a later invention was made in order for the examiner to consider the applicability of 35 U.S.C. 103(c) and potential 35 U.S.C. 102(e), (f) or (g) prior art under 35 U.S.C. 103(a).

8. Claims 12-14 are rejected under 35 U.S.C. 103(a) as being unpatentable over Alkire et al. The Alkire et al patent is taken as above. Claim 12 specifies a particular size for the holes in the perforated electrodes. Alkire et al teach that the perforated electrodes are porous and that they made be made of a screen material, but does not specify a particular size of the openings. The size of the openings is a result effective variable. Choice of an appropriate size would have been a matter of routine optimization based on process parameters such as desired flow of electrolyte and current. Claims 13 and 14 specify that the spacing between the perforated plate disposed on the object side and the object is 10 cm or less, preferably 2 cm or

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less. The Alkire et al patent is silent as to the exact spacing. However, Alkire et al teach that electrode 114 is in spaced parallel relation with the object to be plated 120 and is in close proximity thereto so that the primary current distribution at the cathode is highly uniform (column 3, lines 14-18). Choice of an appropriate close spacing would have been a matter of routine optimization based on the teaching of Alkire et al.

9. Claims 7 and 8 are rejected under 35 U.S.C. 103(a) as being unpatentable over Alkire et al. in view of The Condensed Chemical Dictionary

10. The Alkire et al patent is taken as above. The prior art of record is indicative of the level of skill of one of ordinary skill in the art. Claim 7 differs from Alkire et al by reciting that the material from which the conductor which electrically connects the perforated plates is made has chemical resistance to the plating solution, while claim 8 recites that the material comprises copper. The Condensed Chemical Dictionary discloses that copper is a good conductor of electricity. It would have been obvious at the time the invention was made for the bus which electrically connects perforated electrode plates 110 and 114 to comprise copper because the purpose of the bus is to conduct electricity and copper is a good conductor as shown by the Condensed Chemical Dictionary.

11. Claims 9 and 10 are rejected under 35 U.S.C. 103(a) as being unpatentable over Alkire et al in view of Angelopoulos et al (5,300,208) and Takada et al (6,291,761).

12. The Alkire et al patent is taken as above. Claim 9 differs from Alkire et al by reciting a clip to connect the conductor while claim 10 recites that the clip comprises copper wire covered with vinyl chloride. The Angelopoulos et al patent is directed to plating on circuit boards and discloses that electrical connection may be made using an alligator clip (column 6, line 22; column 7, line 41). The Takada et al patent discloses that vinyl chloride is a known protective coating for copper wire (column 14, lines 43-44). It would have been obvious at the time the invention was made to have utilized an alligator clip to form a connection to electrodes 110 and 114 of Alkire et al and to have utilized a vinyl chloride coating because alligator clips are known effective means for connecting electrical conductors as shown by Angelopoulos et al and vinyl chloride is a common insulator used with copper wire as shown by Takada et al.

*Claim Rejections - 35 USC § 112*

13. The following is a quotation of the second paragraph of 35 U.S.C. 112:

The specification shall conclude with one or more claims particularly pointing out and distinctly claiming the subject matter which the applicant regards as his invention.

14. Claims 11 and 18-22 are rejected under 35 U.S.C. 112, second paragraph, as being indefinite for failing to particularly point out and distinctly claim the subject matter which applicant regards as the invention.


15. Applicant's claims are directed to a metal plating apparatus. The apparatus may be used to plate workpieces with a variety of configurations. Claims 11 and 18


recite limitations which relate the structure of the apparatus to the configuration of the workpiece to be plated. These limitations are indefinite because the structure of the workpiece is related to the intended use of the apparatus. Applicant may wish to similar claim limitations in claims directed to a method of plating rather than to apparatus for plating.

Any inquiry concerning this communication or earlier communications from the examiner should be directed to William T. Leader whose telephone number is 571-272-1245. The examiner can normally be reached on Mondays-Thursdays and alternate Fridays, 7:30-4:00.

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Roy King, can be reached on 571-272-1244.

Any inquiry of a general nature or relating to the status of this application or proceeding should be directed to the receptionist whose telephone number is 703-308-0661.

  
William Leader  
December 22, 2003

ROY KING   
SUPERVISORY PATENT EXAMINER  
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